

REMARKS

Claims 1-4, 7-22, 25-33 and 48-63 are pending in this application. Upon entrance of the above amendment, claims 50-62 will be cancelled. Of these claims, claims 1-4, 7-13, 16-22, 25-29, 32 and 33 stand rejected under 35 USC §102(b) as being anticipated by Canadian Patent CA 02391894 issued to Tashiro et al., and claims 14-15, 30 and 31 stand rejected under 35 USC §103(a) as being unpatentable over Tashiro et al. in view of Blunk, JP05-182679 or JP62-272465. Further, claims 48 and 49 stand rejected under 35 USC §112, second paragraph, as being indefinite for the reasons set forth on page 3 of the Office Action.

In view of the preceding amendments, and the following remarks, these rejections are traversed, and reconsideration of this application is respectfully requested.

Claims 50-63 have been withdrawn from consideration as being directed to a non-elected invention. By the above amendment, these claims have been cancelled. It is therefore believed to be proper that this amendment being entered under 37 CFR 1.116(a).

According to the invention, most of the graphite or conductive particles dispersed in the polymeric material that make up the composite plate have an original particle size or diameter after grinding that is greater than the final thickness of the plate itself. As discussed in paragraph 42 of the specification, expanded graphite sheets are broken down by a suitable grinding process to produce graphite particles having a size in the range of 0.4 - 3 mm, where the particle size is greater than about 10% of the final plate thickness. The graphite particles are then mixed with the polymeric material and molded into the separator plates. The plates are then reduced in thickness to the desired plate thickness,

where the size of the particles are reduced accordingly. However, the original sizes or diameter of most of the particles before the plate thickness is reduced is greater than the final plate thickness. By making the particles of a relatively large size, the electrical resistance of the plate is reduced so that it better conducts electricity through the fuel cell stack.

Dependent claims 48 and 49 have been amended above to more clearly define that the graphite particle size is originally greater than the total plate thickness before the plate is reduced in size. It is believed that this amendment overcomes the §112, second paragraph, rejection, and it is believed to be proper that this amendment be entered under 37 CFR §1.116(a) because it puts this application in condition for allowance.

Applicant has tried various language in the independent claims 1 and 18 to state that the size of the particles dispersed in the polymeric material, when the plate is being fabricated, is greater than the thickness of the final plate. Upon entrance of the above amendment, the independent claims 1 and 18 will state that the particle size of a substantial portion of the conductive material dispersed in the polymeric material has an original particle size greater than the thickness of the plate. It is believed to be proper that these amendments be entered under 37 CFR 1.116(a) because it puts this application in condition for allowance.

Toshiro et al. discloses a composite separator plate for a fuel cell that includes a polymeric material with expanded graphite particles dispersed therein. However, the size of the particles in the dispersion that makes up the plate is significantly smaller than the particles as claimed by Applicant. Particularly, the size or diameter of the graphite particles fairly taught or suggested by Toshiro et al. is significantly less than the thickness of the plate itself. This is shown by the

language on pages 15 and 16 of Toshiro et al. that talk about particle sizes of 25 µm, 50 µm, 50-500 µm, 80-500 µm, 80-200 µm, 1,000 µm or less, 80µm - 800 µm, 100 µm - 500 µm, 120µm, - 300 µm and 150 µm - 300 µm. None of these particle sizes approach the preferred thickness of the separator plate, and thus Applicant submits that the teachings of Toshiro et al. do not anticipate independent claims 1 and 18 as amended.

Additionally, dependent claims 2 and 19 state that the expanded graphite comprises between about 10% and about 50% by volume of the plate. This concentration of expanded graphite particles also provides an improvement in the electrical conductivity of the plate. Toshiro et al. discloses a percentage of 55% - 85% of expanded graphite particles on page 33, and thus, has a significantly greater percentage of graphite.

Applicant has further reviewed Blunk, JP05-182679 and JP62-272465, and can find no teaching therein of particle sizes of graphite in a composite separate plate. Therefore, Applicant submits that Blunk, JP05-182679 and JP62-272465 cannot provide the teaching missing from Toshiro et al. to make Applicant's independent claims 1 and 18 obvious.

It is now believed that this application is in condition for allowance. If the Examiner believes that personal contact with Applicant's representative would expedite prosecution of this application, he is invited to call the undersigned at his convenience.

Applicant is filing concurrently with this Response, a Power of Attorney to Prosecute Applications before the USPTO (appointing practitioners associated with the Customer No. 65798 power of attorney and changing the

Correspondence Address as identified below) along with a Statement under 37 CFR 3.73(b).

Respectfully submitted,

WARN, HOFFMANN, MILLER & LaLONE,
P.C.
Attorney for Applicants

By: 
John A. Miller
Reg. No. 34985

Dated: 2/5/07
P.O. Box 70098
Rochester Hills, MI 48307
Telephone: (248) 364-4300
Facsimile: (248) 364-4285